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FURNITURE MAKING

ADVANCED PROJECTS IN WOODWORK

By IRA S. GRIFFITH

The Manual Arts Press

Peoria, Illinois



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FURNITURE MAKING

ADVANCED PROJECTS IN WOODWORK

BY IRA S. GRIFFITH, A. B.

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Author of "Woodwork for Beginners," "Essentials of Woodworking," "Carpentry"

"Woodwork for Secondary Schools," "Correlated Courses in Woodwork and Mechanical Drawing,"
and "Projects for Beginning Woodwork and Mechanical Drawing."



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PREFACE.

ADVANCED PROJECTS IN WOODWORK is a collection of projects designed to meet the needs of classes in high school woodworking. These projects presuppose familiarity with woodworking processes, tools, and the two simple joints required in the making of projects contained in the author's *Projects in Beginning Woodwork and Mechanical Drawing*.

The drawings are complete only as to their general dimensions. The working out of details, such as the sizes of mortises and tenons and their locations, is left for the pupil in his work in drawing and design.

It is expected that the projects will afford suitable basic material for classes in woodworking design. It remains for the instructor to point out the manner in which this material may be used. For illustration, many beginning students are slow in appreciation of possible modifications in structure or decoration. Circular tops may be used instead of square or octagonal, and vice versa. Modification of the manner of filling side spaces with slats offers variety in initiative. Vertical posts may be made tapering and vice versa. Rails and stretchers may be variously employed. There is almost always a choice in the matter of joints,—keyed or thru or blind tenon. Fig. 1 is suggestive as to possible modifications of a type.

In addition to the possible structural modifications, the plates suggest variation in the matter of decorative ornament such as pierced and carved forms and simple inlay. Such ornament will, of course, be kept subordinate to the structural design.

The upholstering of stool tops and seats for chairs provides another problem in variation.

Little, if any, use is made of dowels as substitutes for the mortise-and-tenon. While it is true that modern commercial practice makes much use of dowels in this way, the author feels that such practice is too often contrary to the principles of good construction. Its genesis lies in economy of material rather than in any superiority as a fastening device.

In the designing of these projects the author has had in mind at all times the thought that most

of the students using them would have access only to a band-saw or jig-saw and a miter-box in addition to the regular hand tool equipment. For this reason such projects as hall clocks, mission beds, etc., have been excluded. The exceptional student will find projects of sufficient size to

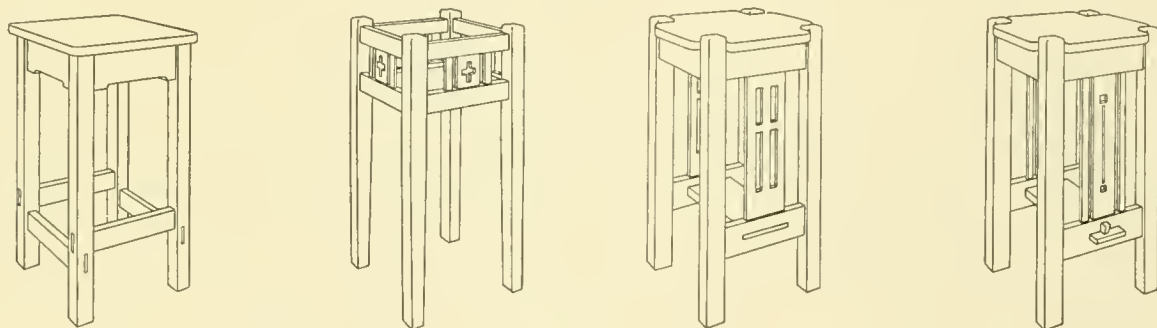


FIG. 1.

tax his ability and muscle. Easier projects and lighter projects have been provided for the weaker members of the class while the use of slats or their omission will provide additional variation in time of execution.

The use of stock ordered S-4-S (surfaced on four sides) has not been anticipated. The use of stock S-2-S and moldings such as are carried in stock by lumber yards is presupposed. If a working principle for the use of stock partly prepared were asked for it would be: Any material

that is carried as stock and which does not have to be ordered especially worked for the project a boy elects or designs may be made use of legitimately. Such a principle would permit the use of stock S-2-S, moldings of stock pattern, hardware such as hinges and locks without any suggestion of deception. It would exclude table legs and tops, etc., especially prepared at a mill, and offers a rational dividing line between two extremes, neither of which is desirable.

Of course, these projects may be used in the teaching of the use of woodworking machinery.

No definite notes as to methods of procedure are given in this book for the student is supposed to have acquired, thru experience with the projects in the elementary book, enough insight to enable him to proceed on his own accord. Definite instruction in making the new joints, in wood-finishing, etc. will be found in *Essentials of Woodworking*, or *Woodwork for Secondary Schools*, companion books by the same author.

While these projects are especially arranged for use with the courses outlined and discussed in *Correlated Courses in Woodwork and Mechanical Drawing*, by the author, there is nothing in the form of the plates themselves to prevent their being used with any course in woodwork.

July, 1912

IRA S. GRIFFITH.

The inking of the drawings and the making of the perspectives in this book is the work of Mr. George Gordon Kellar.

LIST OF PLATES.

GROUP IX.—JOINERY.

- | | | |
|--|------------------------------|----------------------------|
| 1. Exercises—Keyed tenon, Blind Mortise-and-Tenon. | 12. Taboret (octagonal top). | 26. Book Trough. |
| 2. Exercises—Miter Joint, Glue Joint. | 13. Taboret (round top). | 27. Screen. |
| 3. Exercises—Modeling, Hammer Handles. | 14. Small Table. | 28. Tea Table. |
| 4. Necktie Rack. | 15. Taboret (square top). | 29. Hall Rack. |
| 5. Footstool. | 16. Piano Bench. | 30. Wall China Rack. |
| 6. Book-rack. | 17. Piano Bench. | 31. Side Chair. |
| 7. Upholstered Stool. | 18. Book Stand. | 32. Arm Chair. |
| 8. Leg Rest. | 19. Umbrella Stand. | 33. Morris Chair. |
| 9. Cricket. | 20. Umbrella Stand. | 34. Electric Reading Lamp. |
| 10. Wall Shelves. | 21. Jardiniere Stand. | 35. Pedestal. |
| 11. Stool (square). | 22. Magazine Stand. | 36. Occasional Rocker. |
| | 23. Roman Seat. | 37. Mission Chair. |
| | 24. Light Stand. | 38. Drop Leaf Table. |
| | 25. Stool (square). | |

GROUP X.—CABINET WORK.

- | | | |
|---|----------------------|-------------------------|
| 39. Exercises—Mortise-and-Tenon Joint, Rabbed Joint, Grooved Joint. | 41. Waste Paper Box. | 46. Chafing-dish Stand. |
| 40. Exercises—Thru Multiple Dovetail, Half-blind Dovetail. | 42. Wall Cabinet. | 47. Cabinet. |
| | 43. Telephone Table. | 48. Library Table. |
| | 44. Sewing Cabinet. | 49. Writing-desk. |
| | 45. Writing Table. | 50. Dressing Table. |
| | | 51. Linen Chest. |

PRICE LIST FOR YEAR 19____, 19____

LUMBER—Quality, 1st, clear, and kiln-dried.

KIND OF WOOD	Per 1000 feet when surfaced on two sides							
Thickness in the Rough	$\frac{3}{8}"$	$\frac{1}{2}"$	$\frac{5}{8}"$	$\frac{3}{4}"$	1"	$1\frac{1}{4}"$	$1\frac{1}{2}"$	2"
Yellow Poplar								
White Pine								
$\frac{1}{4}$ Sawed White Oak								
Mahogany								
$\frac{1}{4}$ Sawed Red Sycamore								
Black Walnut								
Plain Sawed Red Oak								

HARDWARE—

For prices on hardware consult Hardware Catalog provided for you.

Figure retail price, that is, figure screws at price per dozen, not price per gross.

WOODFINISH—

Per square foot of surface covered.

LABOR—

Per hour.

(Form for high school use)

BILL OF MATERIAL

NAME_____

DATE BEGUN_____

CLASS_____

DATE FINISHED_____

ARTICLE_____

EXTRA HOURS_____

Pieces	Size	Description	Price	Feet	Cost		
2	$\frac{1}{2}$ x $3\frac{1}{4}$ x $12\frac{1}{2}$	Walnut Slats S-2-S to $\frac{3}{8}$ in.	.10	4.4	.39		
1	1 x $8\frac{1}{4}$ x $14\frac{1}{2}$	" Stretcher " $\frac{7}{8}$ in.					
6	1 x $3\frac{1}{4}$ x $12\frac{1}{2}$	" Rails " "					
1	1 x $14\frac{1}{4}$ x $14\frac{1}{2}$	" Top " "					
4	$1\frac{1}{2}$ x $1\frac{1}{2}$ x $24\frac{1}{2}$	" Posts " $1\frac{1}{4}$ in.	.11	2	.22		.66
8	2 inch No. 10	Flat Head Brt. Screws	.00 $\frac{1}{2}$.04		
4	$1\frac{1}{2}$ inch No. 10	" " " "	.00 $\frac{1}{4}$.01		.05
	13 sq. feet	Wood Finish	.01				.13
		MATERIAL COST.....					.84
	30 hrs.	Labor	.15			4	.50
							TOTAL COST \$5.34

INSTRUCTIONS FOR MAKING BILL OF MATERIAL.

Under "pieces" put the number of parts that are alike.

Under "size" put the various dimensions of pieces. In finding the sizes of the various pieces of lumber, examine the working drawings for finished dimensions, making due additions for tenons, then add $\frac{1}{4}$ " to the width and $\frac{1}{2}$ " to the length to allow for cutting out and squaring up. Though you are to make use of stock mill-planed to thickness, you are to specify the thickness from which this mill-planed stock is got. Allow at least $\frac{1}{8}$ " for mill-planing.

Remember that length always means along the grain.

Fractions of an inch in width and length are not considered. Neither are fractions of a cent in the final results. If the fraction is $\frac{1}{2}$ or over, take the next higher whole number. If it is less than $\frac{1}{2}$, drop it. Fractions of an inch in thickness that are over 1" and fractions of a cent in the price per foot are to be figured as they are.

Lumber is measured by the superficial foot which is 1" x 12" x 12". Boards that are less than 1" thick are sold by surface measure. In other words, boards less than 1" thick are figured for quantity as 1" thick.

Standard sawed thicknesses are 1", $1\frac{1}{4}$ ", $1\frac{1}{2}$ ", 2", $2\frac{1}{2}$ ", 3", $3\frac{1}{2}$ ", 4". Thicknesses less than 1" necessitate re-sawing these sizes. In some communities the price per square foot for re-sawed stock varies for each difference of $\frac{1}{4}$ " in thickness.

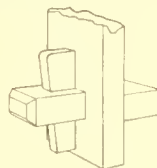
In figuring, multiply the length by the width by the thickness, by the number of pieces. If any piece is less than 1" thick figure it as 1". Combine all results that are the same in price per foot. Reduce to square feet by dividing by 144. Reduce decimally and do not carry the result beyond tenths place. Dispose of any fractional part beyond tenths as directed above.

The price list gives the price of lumber per 1,000 feet. The price per foot is readily obtainable.

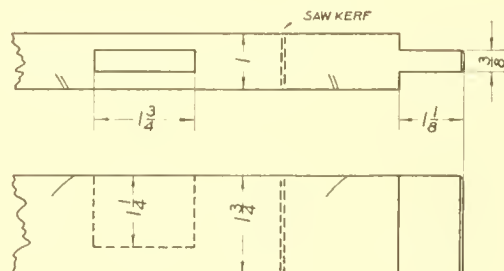
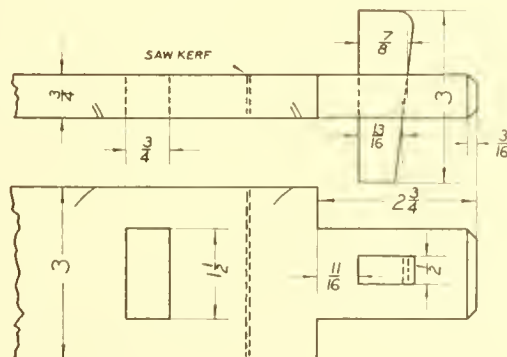
In figuring finish for these cabinet pieces, double the number of feet of stock as given by the stock bill to get the number of feet of finish. This is only an approximate method but is sufficiently accurate for such pieces as are to be made in first year high school, as specified in Group IX of this book.

EXERCISE (PREPARATORY TO GROUP IX)

KEYED TENON

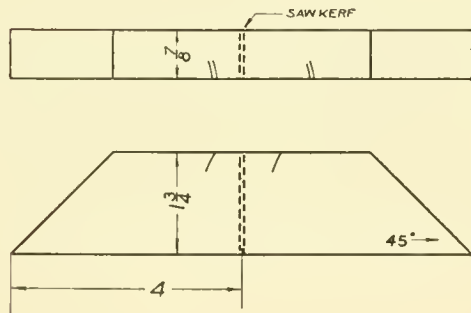


BLIND MORTISE AND TENON

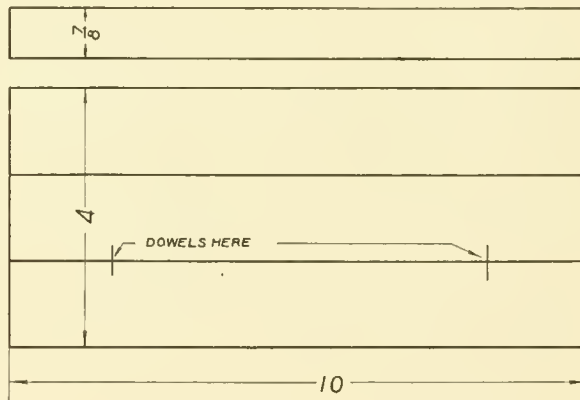
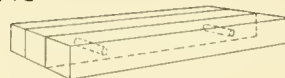


EXERCISE (PREPARATORY TO GROUP IX)

MITER JOINT

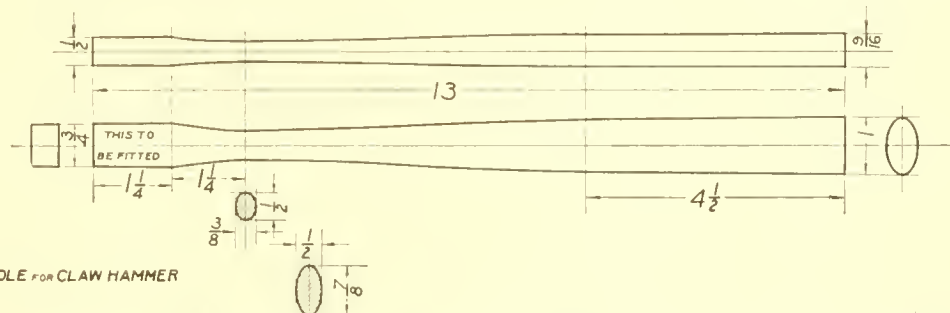


GLUE JOINT-DOWELING

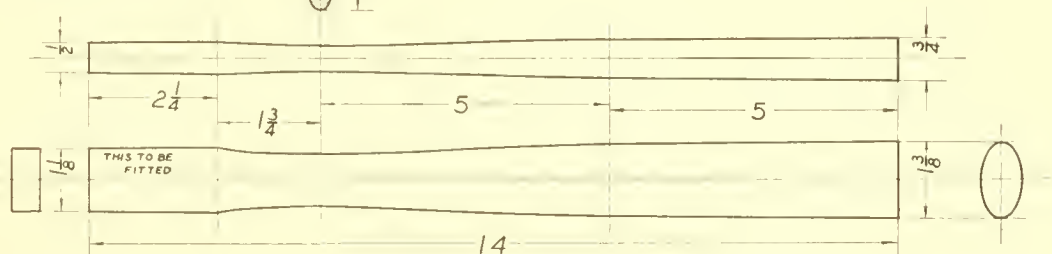


EXERCISE PREPARATORY TO GROUP IX (CHOOSE ONE)

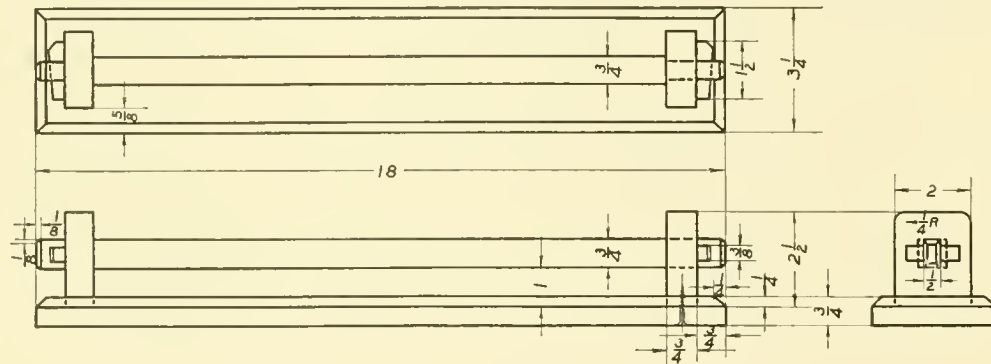
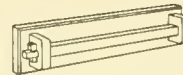
HANDLE FOR BALL PEEN HAMMER



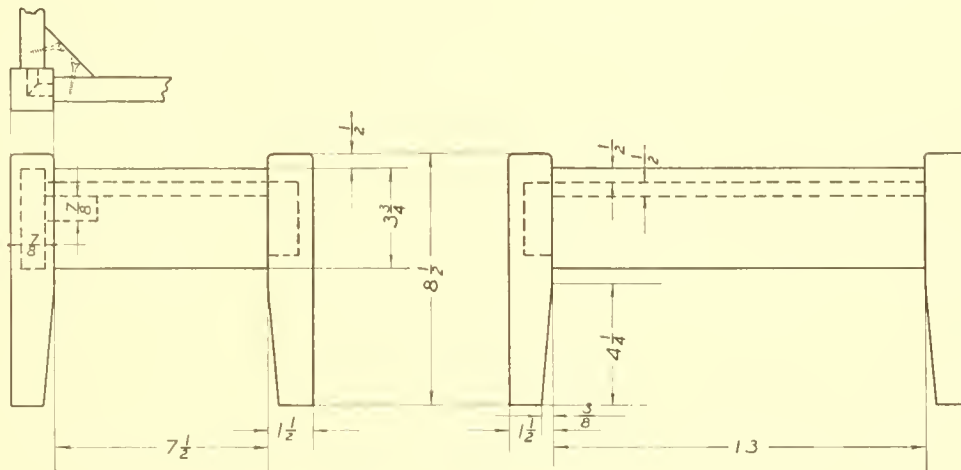
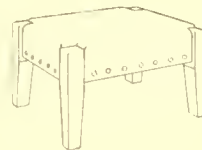
HANDLE FOR CLAW HAMMER

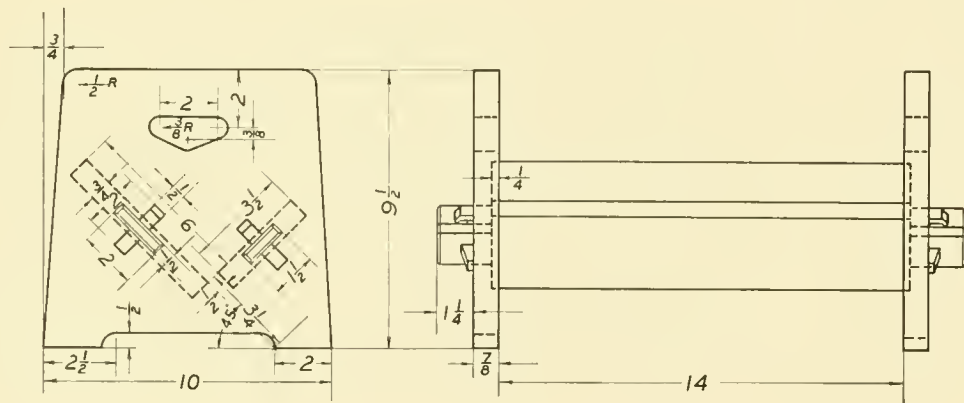


NECKTIE RACK

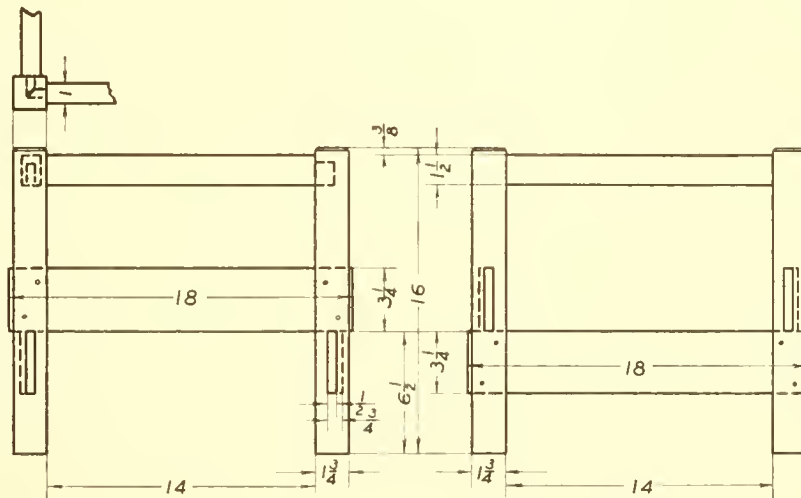
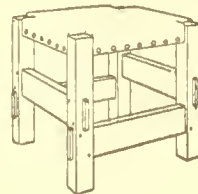


FOOT STOOL



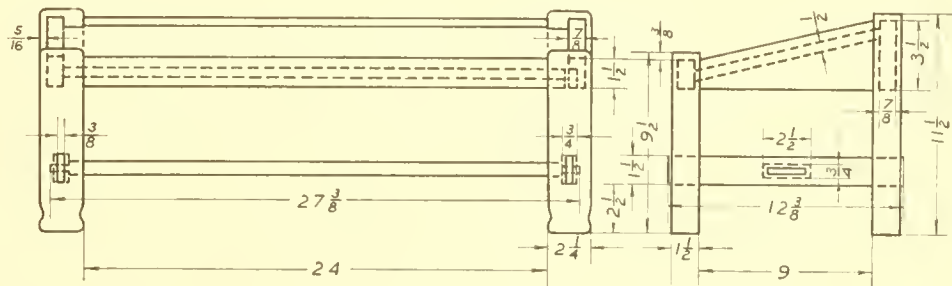
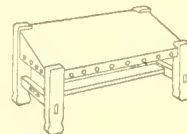


UPHOLSTERED STOOL

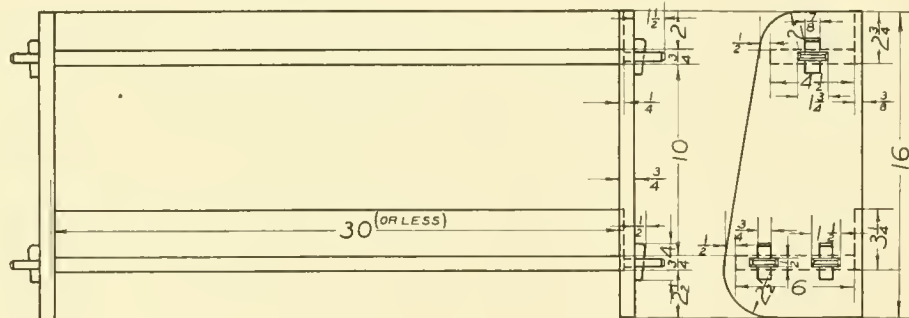
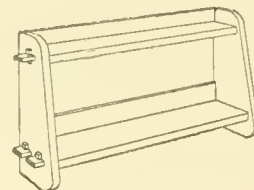




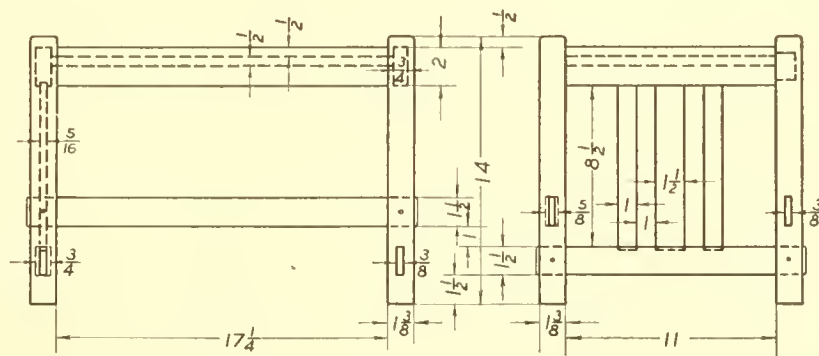
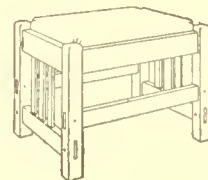
CRICKET



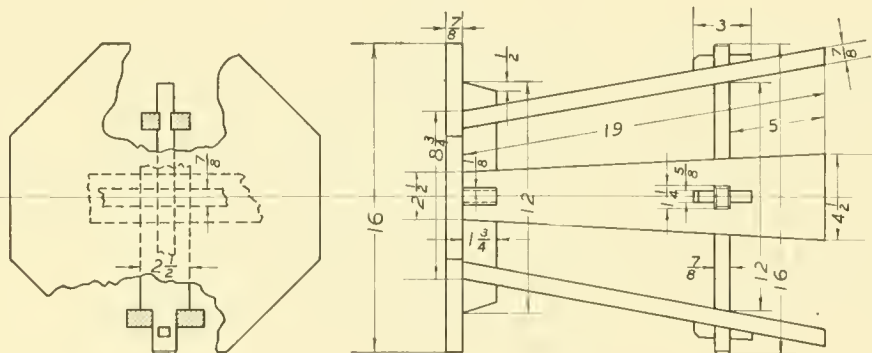
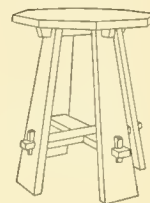
WALL SHELVES



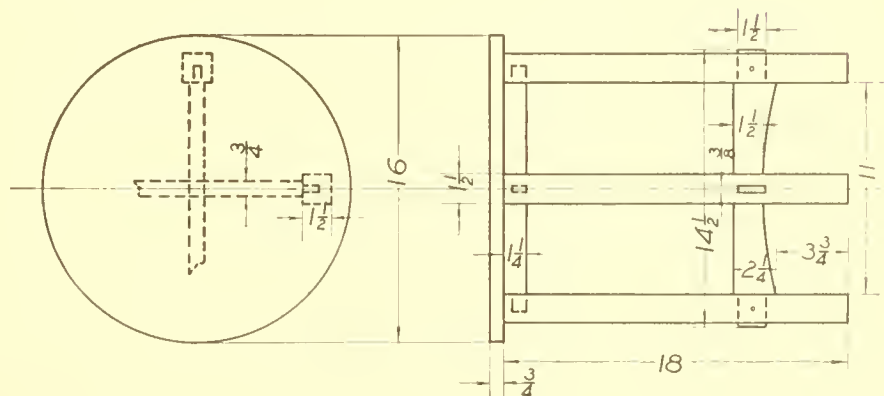
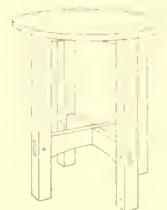
STOOL

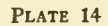


TABORET



TABORET





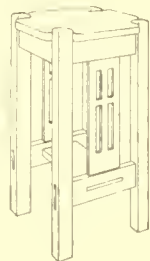
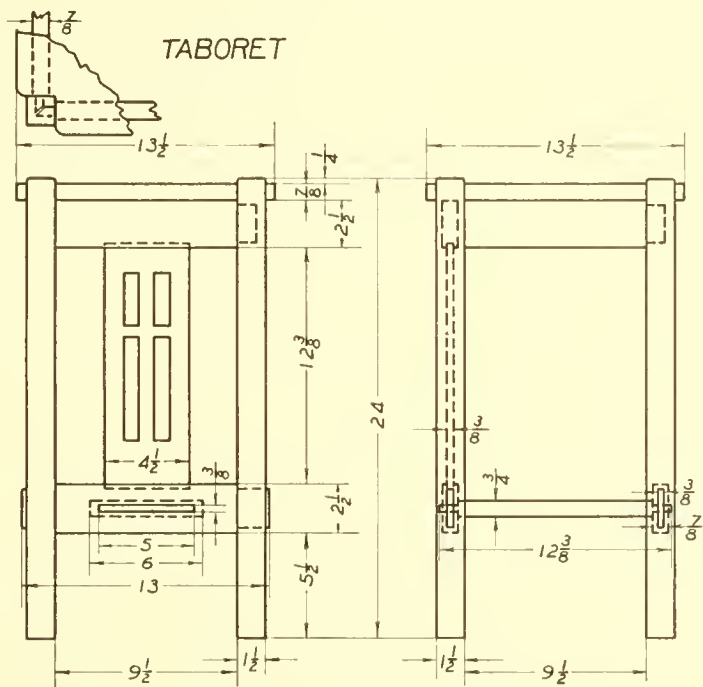
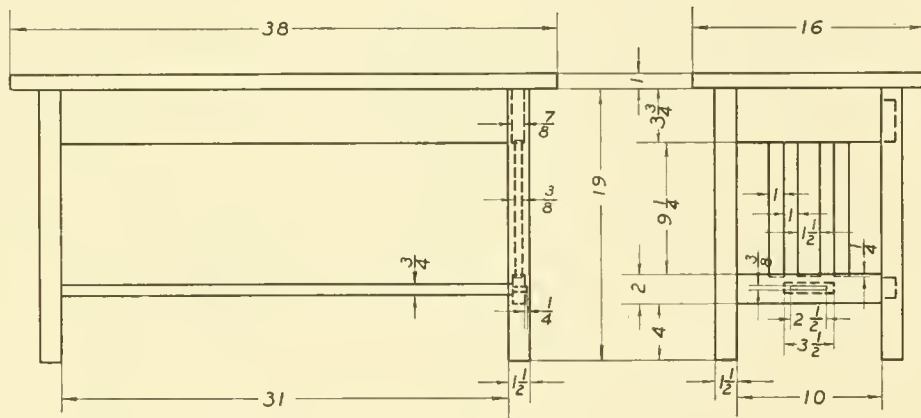
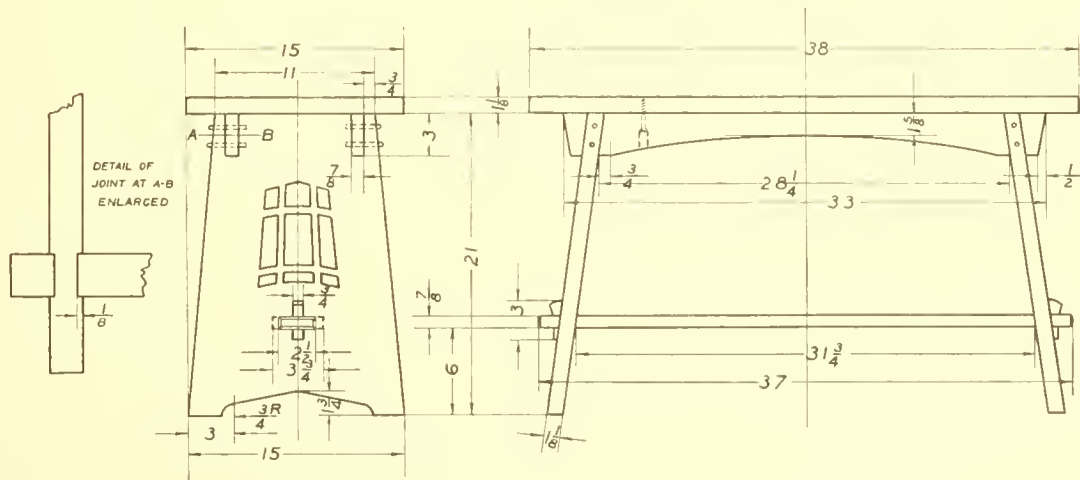
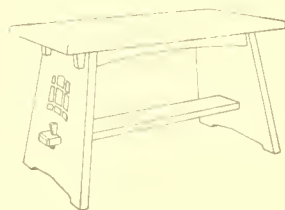


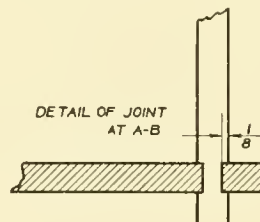
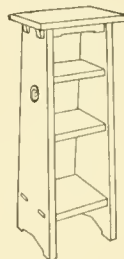
PLATE 15



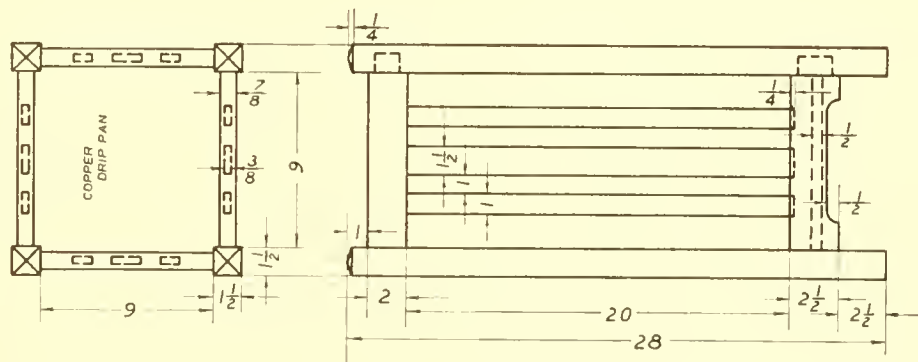
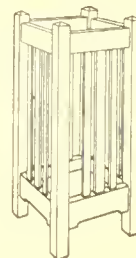
PIANO BENCH



Technical drawing of a wooden cabinet with dimensions in inches. The drawing shows a side view of a cabinet with a top, two drawers, and a base. Dimensions include overall width of 16 inches, top thickness of $\frac{3}{4}$ inch, and various internal and external measurements for the drawers and base. A spiral handle is shown on the right drawer. Labels A and B are present on the right side.



UMBRELLA STAND



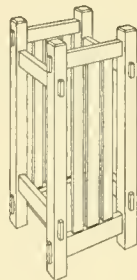
Technical drawing of a wooden bench, showing top and side views with dimensions in feet and inches.

Top View Dimensions:

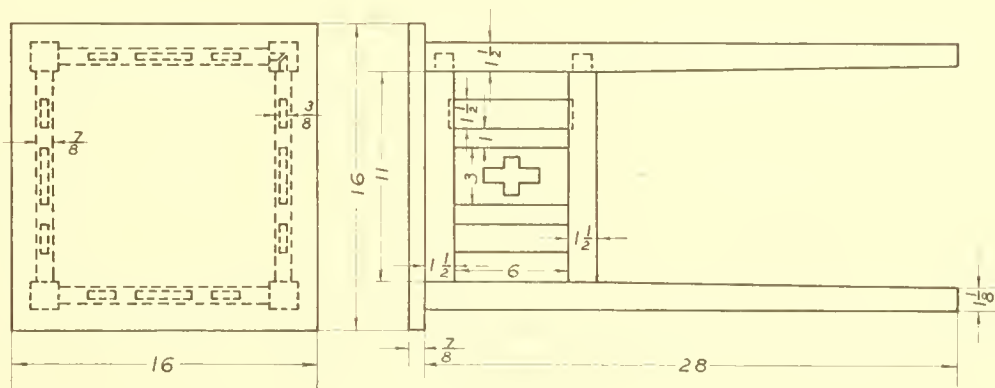
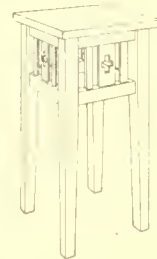
- Overall length: 14
- Overall width: 14
- Seat width: 24 $\frac{1}{2}$
- Seat thickness: $\frac{3}{8}$ THICK
- Seat height: 2
- Seat depth: 2
- Seat to backrest distance: 2
- Backrest height: 1 $\frac{1}{2}$
- Backrest width: 4 $\frac{1}{2}$
- Backrest thickness: $\frac{7}{8}$ THICK
- Backrest to seat distance: 2
- Backrest to end distance: 2
- End distance: 2

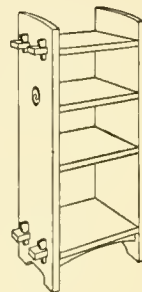
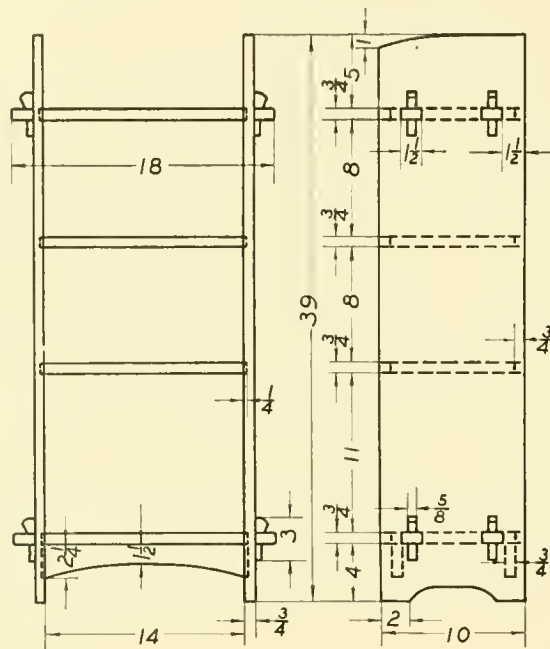
Side View Dimensions:

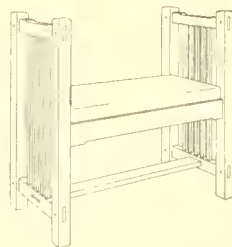
- Overall length: 10 $\frac{1}{2}$
- Overall width: 10 $\frac{1}{2}$
- Seat width: 24
- Seat height: 2
- Seat depth: 2
- Seat to backrest distance: 2
- Backrest height: 1 $\frac{1}{2}$
- Backrest width: 4 $\frac{1}{2}$
- Backrest thickness: $\frac{7}{8}$ THICK
- Backrest to seat distance: 2
- Backrest to end distance: 2
- End distance: 2



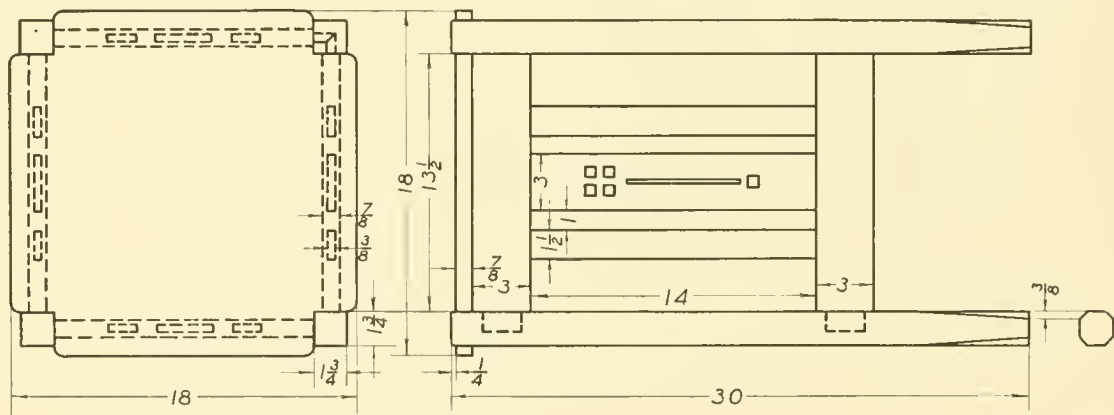
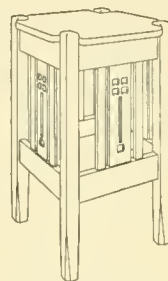
JARDINIERE STAND





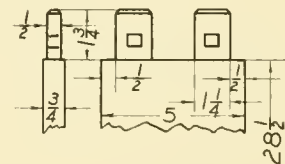
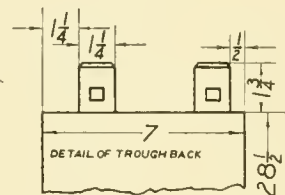
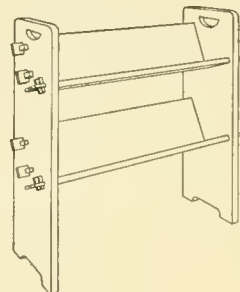
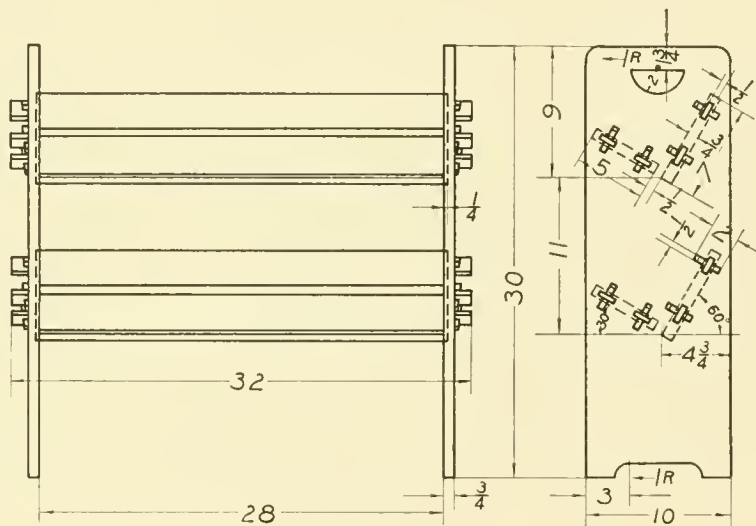
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LIGHT STAND

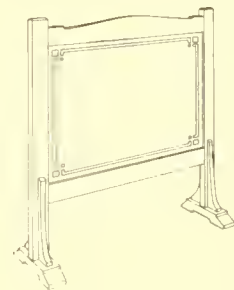
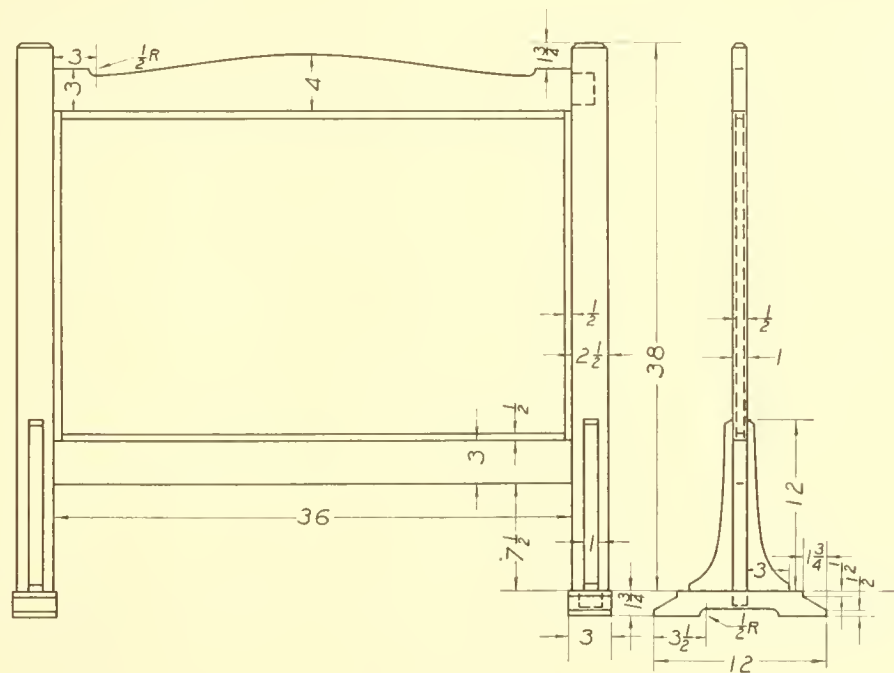


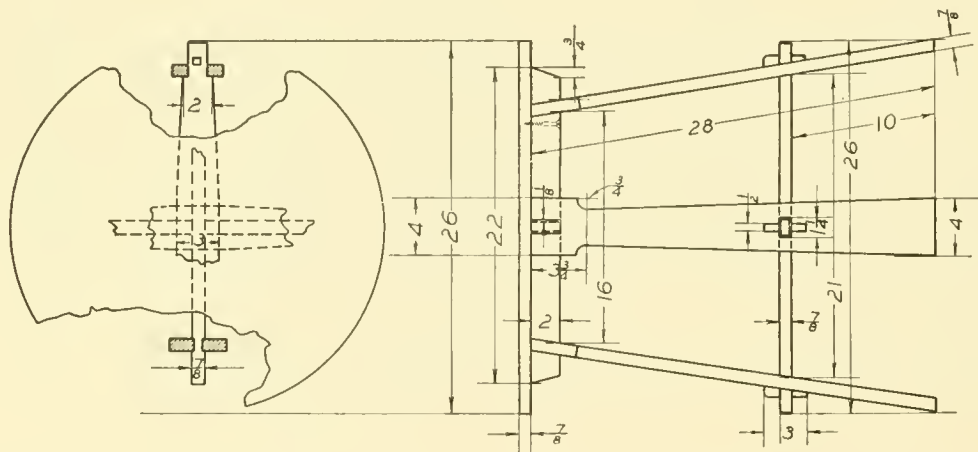


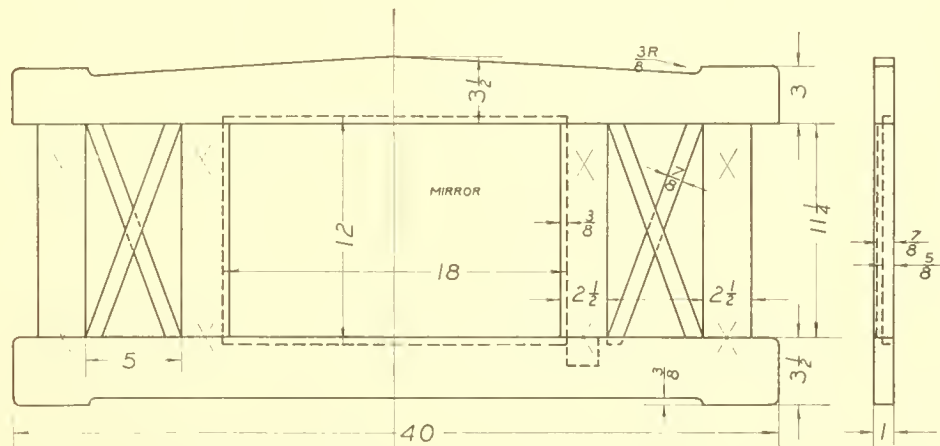
BOOK TROUGH



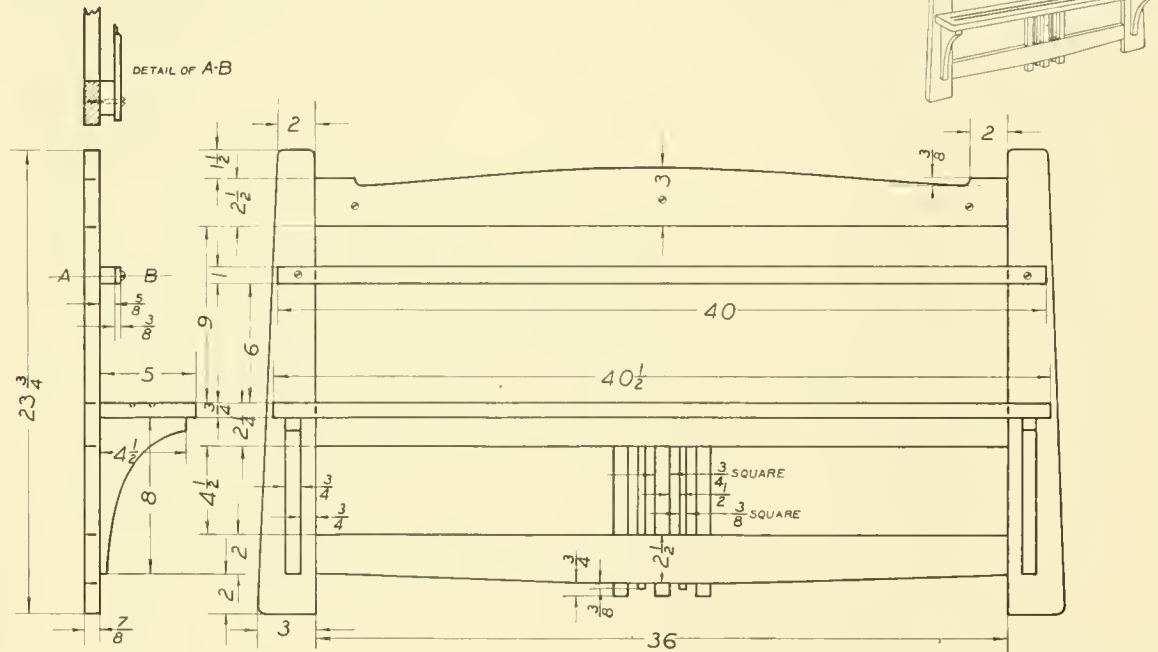
SCREEN



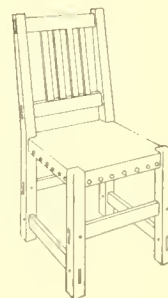
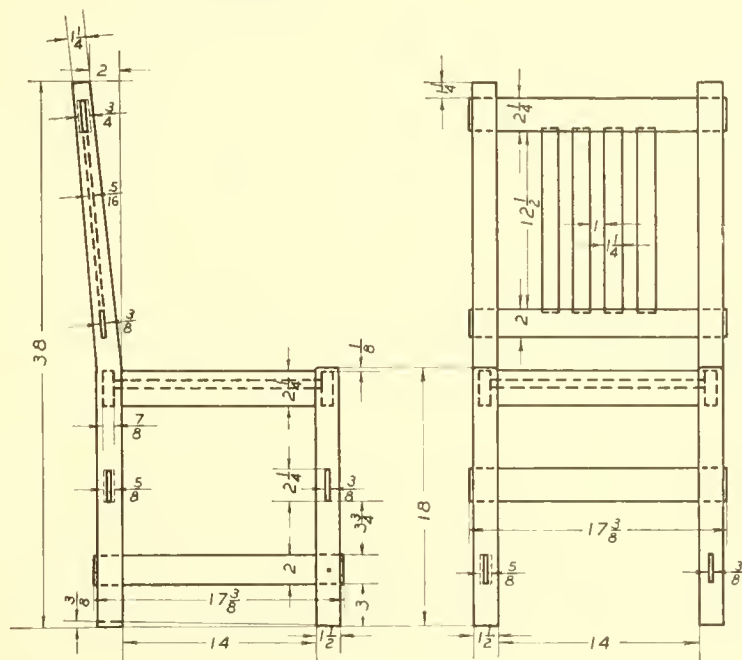


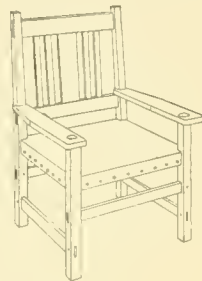


WALL CHINA RACK



SIDE CHAIR



[illegible]

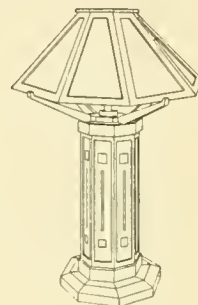


Technical drawing of a lamp, showing three views: top, front, and side. The drawing includes dimensions in inches and fractions of inches.

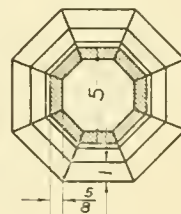
Top View: The lamp has an octagonal base. The central circular opening has a diameter of $2\frac{1}{2}$. The base is divided into eight triangular segments by lines radiating from the center. The overall width of the base is $7\frac{1}{2}$. The height of the base is 18 .

Front View: The lamp has a conical shade. The height of the shade is $9\frac{1}{2}$. The base of the shade is $4\frac{1}{2}$ wide. The lamp has a central column with a diameter of $2\frac{1}{2}$. The height of the lamp body is 12 . The overall height of the lamp is $21\frac{1}{2}$. The lamp has a base with a diameter of 3 .

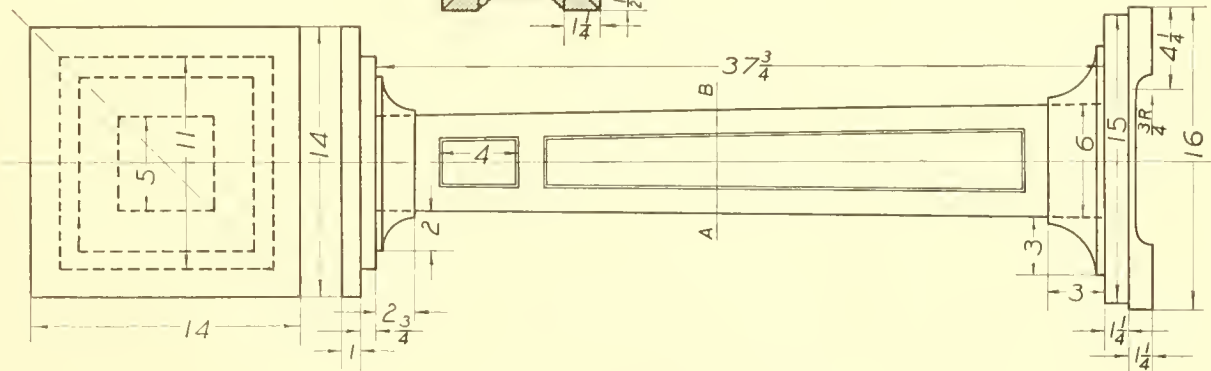
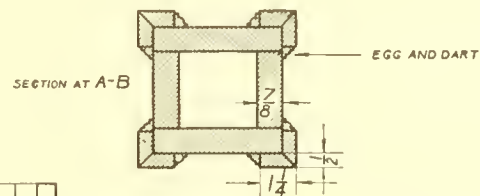
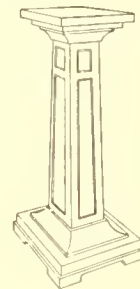
Side View: The lamp has a cylindrical body with a diameter of 12 . The lamp has a base with a diameter of 9 . The lamp has a central column with a diameter of $2\frac{1}{2}$. The lamp has a base with a diameter of 3 .



SECTION AT A-B



PEDESTAL



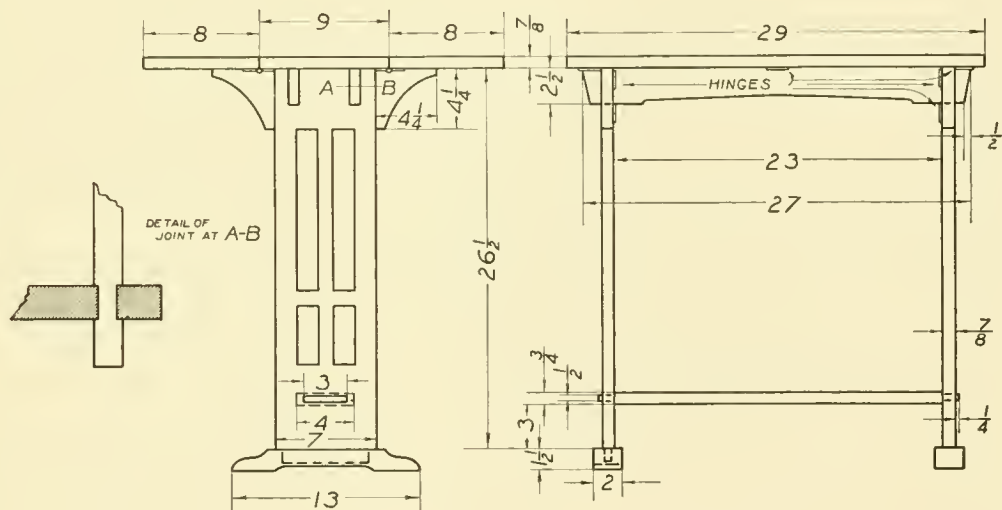


The technical drawing consists of two orthographic projections of a mechanical part.

- Top View (Front View):** Shows a rectangular object with a total width of 26. A central section has a width of 14 and contains six small squares arranged in two rows of three. This central section is flanked by areas labeled a/w . Various thicknesses are indicated: $3\frac{1}{2}$ at the top, $2\frac{3}{4}$ below it, and $5\frac{1}{2}$ at the bottom. A dimension of 4 is shown on the left edge.
- Bottom View (Side View):** Shows the side profile of the object with a total length of 21. It features a central section with a height of $8\frac{3}{8}$ and a base thickness of $4\frac{7}{8}$. Other dimensions include $2\frac{1}{2}$, $1\frac{1}{2}$, and $\frac{1}{2}$.



DROP LEAF TABLE

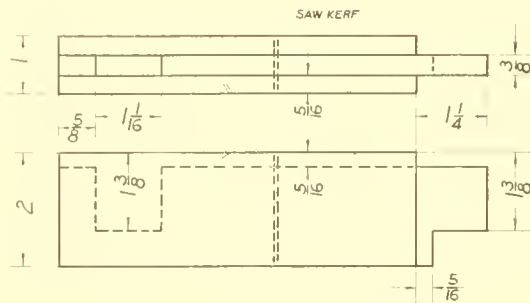
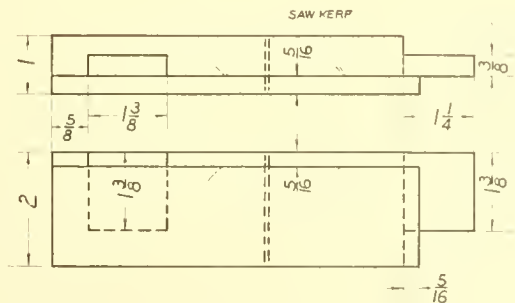
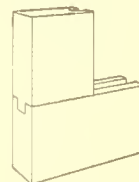


EXERCISE - PREPARATORY TO GROUP X

MORTISE AND TENON-RABBETED

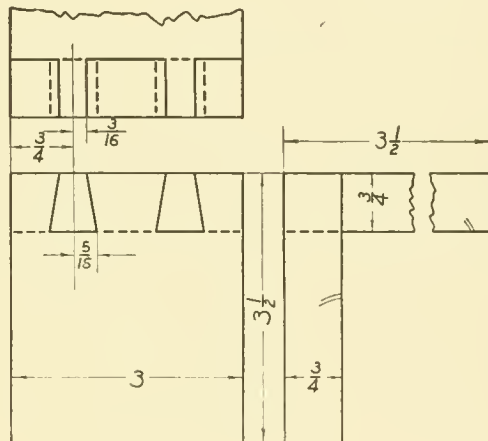
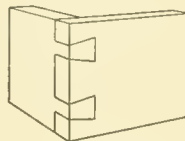


HAUNCHED MORTISE AND TENON-GROOVED

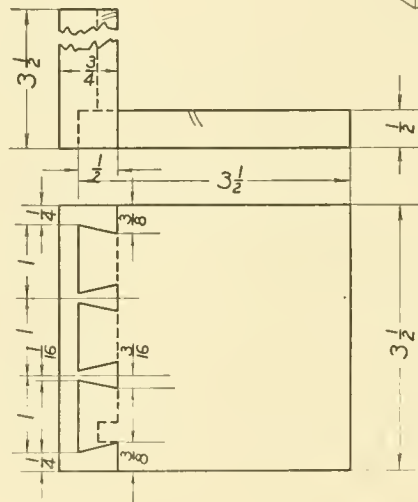
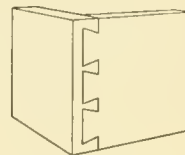


EXERCISE—PREPARATORY TO GROUP X

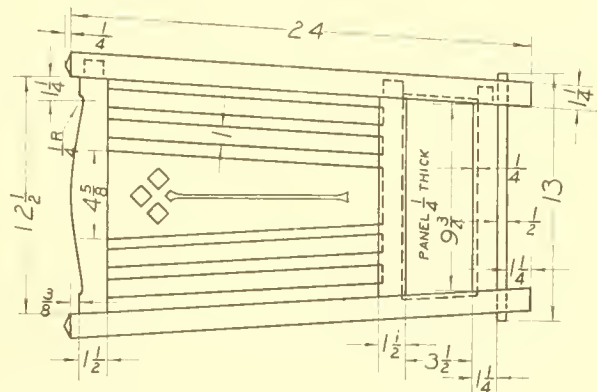
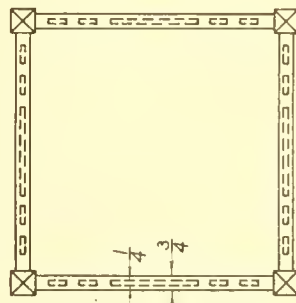
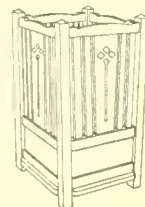
THRU MULTIPLE DOVETAIL

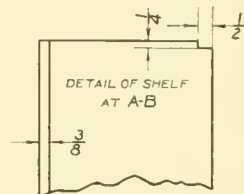


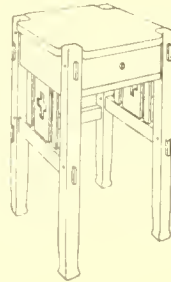
HALF-BLIND DOVETAIL

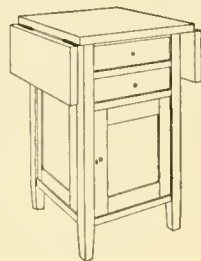


WASTE PAPER BOX

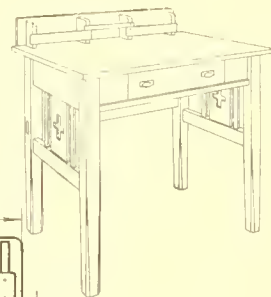
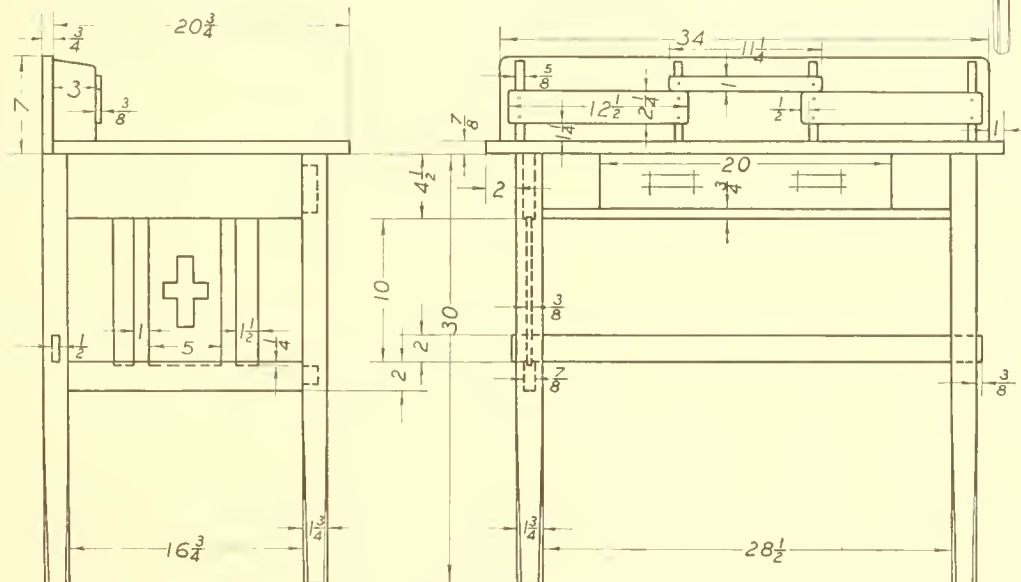




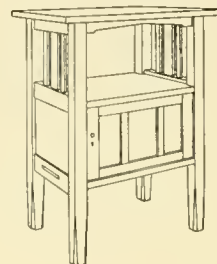
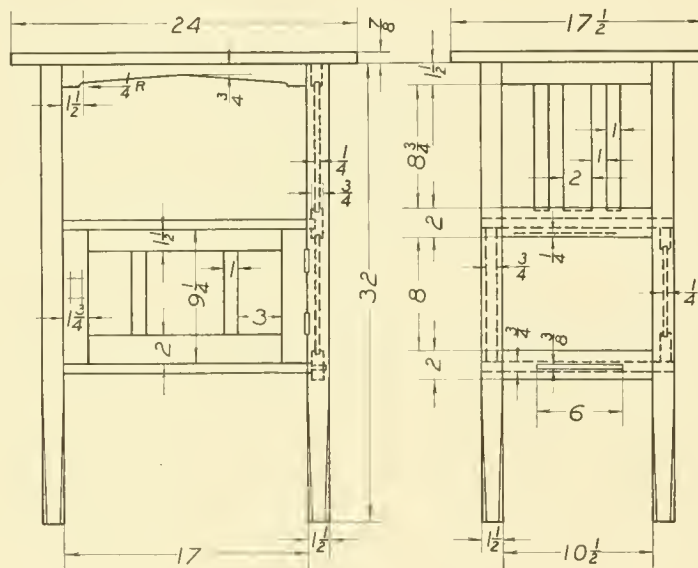




WRITING TABLE



CHAFING DISH STAND



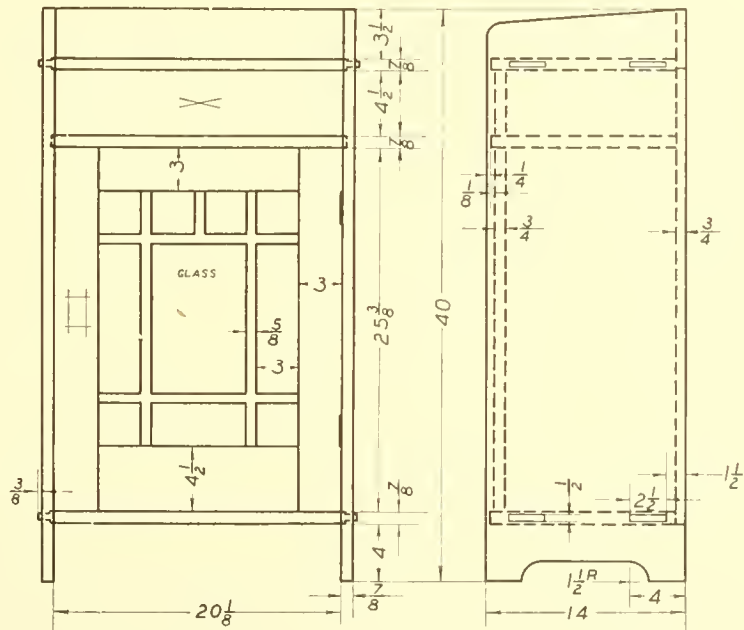
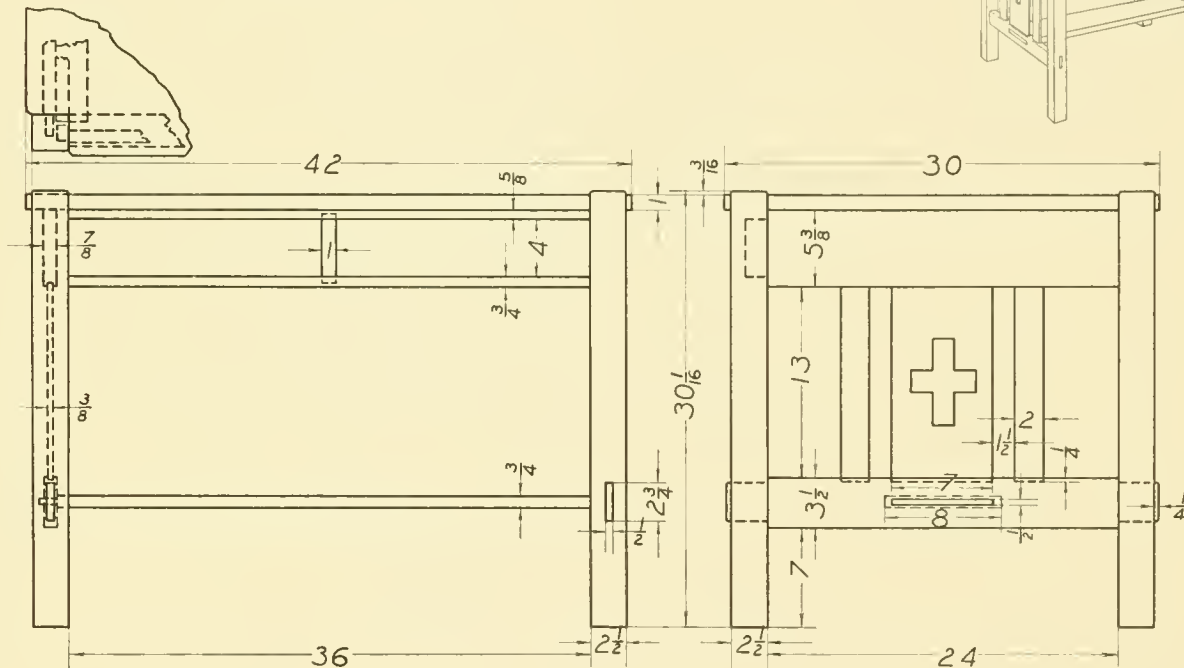
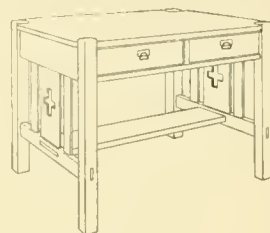
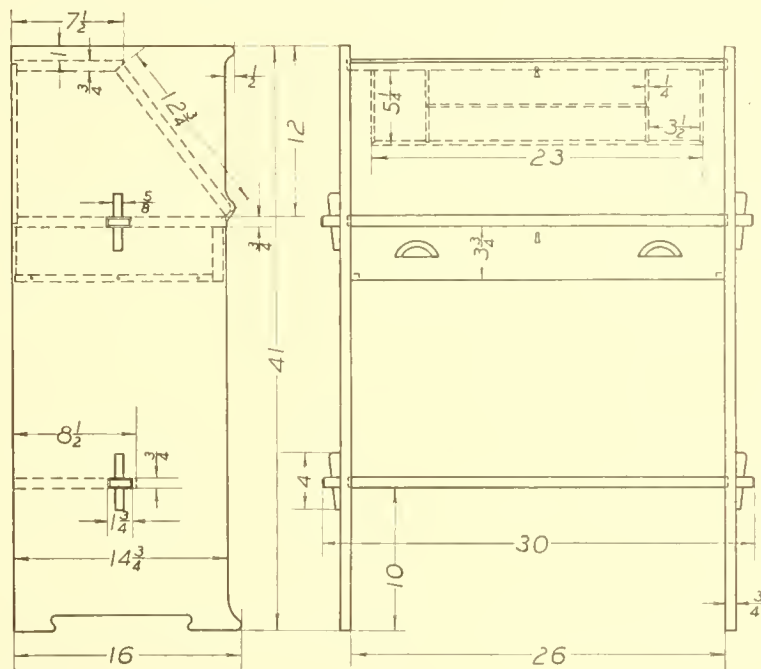


PLATE 47

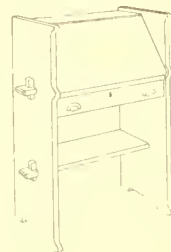
LIBRARY TABLE

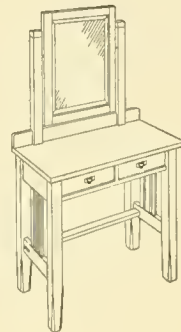


WRITING DESK

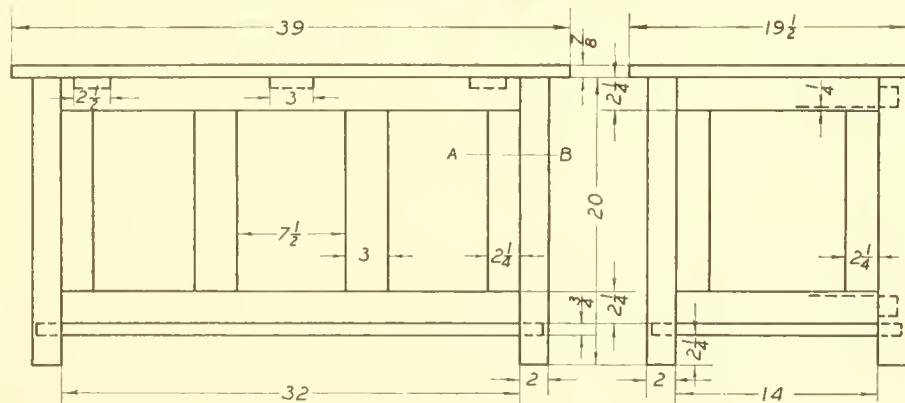
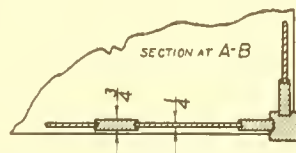


COMMERCIAL DESIGN



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